

SEQUENCE LISTING

<110> Crooke et al.

<120> ANTISENSE MODULATION OF APOLIPOPROTEIN B EXPRESSION

<130> 30566/39662

<150> US 60/426,234
<151> 2002-11-13

<150> PCT/US03/15493
<151> 2003-05-13

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Pro Ala Leu Leu Leu Leu Leu Ala Gly Ala Arg Ala Glu Glu Glu
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atc tat gcc atc tct tct gct gcc tta tca gca agc tat aaa gca gac Ile Tyr Ala Ile Ser Ser Ala Ala Leu Ser Ala Ser Tyr Lys Ala Asp 1840 1845 1850				5690
act gtt gct aag gtt cag ggt gtg gag ttt agc cat cg ^g ctc aac aca Thr Val Ala Lys Val Gln Gly Val Glu Phe Ser His Arg Leu Asn Thr 1855 1860 1865 1870				5738
gac atc gct ggg ctg gct tca gcc att gac atg agc aca aac tat aat Asp Ile Ala Gly Leu Ala Ser Ala Ile Asp Met Ser Thr Asn Tyr Asn 1875 1880 1885				5786
tca gac tca ctg cat ttc agc aat gtc ttc cgt tct gta atg gcc ccg Ser Asp Ser Leu His Phe Ser Asn Val Phe Arg Ser Val Met Ala Pro 1890 1895 1900				5834
ttt acc atg acc atc gat gca cat aca aat ggc aat ggg aaa ctc gct Phe Thr Met Thr Ile Asp Ala His Thr Asn Gly Asn Gly Lys Leu Ala 1905 1910 1915				5882
ctc tgg gga gaa cat act ggg cag ctg tat agc aaa ttc ctg ttg aaa Leu Trp Gly Glu His Thr Gly Gln Leu Tyr Ser Lys Phe Leu Leu Lys 1920 1925 1930				5930
gca gaa cct ctg gca ttt act ttc tct cat gat tac aaa ggc tcc aca Ala Glu Pro Leu Ala Phe Thr Phe Ser His Asp Tyr Lys Gly Ser Thr 1935 1940 1945 1950				5978
agt cat cat ctc gtg tct agg aaa agc atc agt gca gct ctt gaa cac Ser His His Leu Val Ser Arg Lys Ser Ile Ser Ala Ala Leu Glu His 1955 1960 1965				6026
aaa gtc agt gcc ctg ctt act cca gct gag cag aca ggc acc tgg aaa Lys Val Ser Ala Leu Leu Thr Pro Ala Glu Gln Thr Gly Thr Trp Lys 1970 1975 1980				6074
ctc aag acc caa ttt aac aac aat gaa tac agc cag gac ttg gat gct Leu Lys Thr Gln Phe Asn Asn Glu Tyr Ser Gln Asp Leu Asp Ala 1985 1990 1995				6122
tac aac act aaa gat aaa att ggc gtg gag ctt act gga cga act ctg Tyr Asn Thr Lys Asp Lys Ile Gly Val Glu Leu Thr Gly Arg Thr Leu 2000 2005 2010				6170
gct gac cta act cta gac tcc cca att aaa gtg cca ctt tta ctc Ala Asp Leu Thr Leu Leu Asp Ser Pro Ile Lys Val Pro Leu Leu Leu 2015 2020 2025 2030				6218
agt gag ccc atc aat atc att gat gct tta gag atg aga gat gcc gtt				6266

Ser	Glu	Pro	Ile	Asn	Ile	Ile	Asp	Ala	Leu	Glu	Met	Arg	Asp	Ala	Val	
																2045
																2035
																2040
gag	aag	ccc	caa	gaa	ttt	aca	att	gtt	gct	ttt	gta	aag	tat	gat	aaa	6314
Glu	Lys	Pro	Gln	Glu	Phe	Thr	Ile	Val	Ala	Phe	Val	Lys	Tyr	Asp	Lys	
																2050
																2055
																2060
aac	caa	gat	gtt	cac	tcc	att	aac	ctc	cca	ttt	ttt	gag	acc	ttg	caa	6362
Asn	Gln	Asp	Val	His	Ser	Ile	Asn	Leu	Pro	Phe	Phe	Glu	Thr	Leu	Gln	
																2065
																2070
																2075
gaa	tat	ttt	gag	agg	aat	cga	caa	acc	att	ata	gtt	gta	gtg	gaa	aac	6410
Glu	Tyr	Phe	Glu	Arg	Asn	Arg	Gln	Thr	Ile	Ile	Val	Val	Val	Glu	Asn	
																2080
																2085
																2090
gta	cag	aga	aac	ctg	aag	cac	atc	aat	att	gat	caa	ttt	gta	aga	aaa	6458
Val	Gln	Arg	Asn	Leu	Lys	His	Ile	Asn	Ile	Asp	Gln	Phe	Val	Arg	Lys	
																2095
																2100
																2105
																2110
tac	aga	gca	gcc	ctg	gga	aaa	ctc	cca	cag	caa	gct	aat	gat	tat	ctg	6506
Tyr	Arg	Ala	Ala	Leu	Gly	Lys	Leu	Pro	Gln	Gln	Ala	Asn	Asp	Tyr	Leu	
																2115
																2120
																2125
aat	tca	ttc	aat	tgg	gag	aga	caa	gtt	tca	cat	gcc	aag	gag	aaa	ctg	6554
Asn	Ser	Phe	Asn	Trp	Glu	Arg	Gln	Val	Ser	His	Ala	Lys	Glu	Lys	Leu	
																2130
																2135
																2140
act	gct	ctc	aca	aaa	aag	tat	aga	att	aca	gaa	aat	gat	ata	caa	att	6602
Thr	Ala	Leu	Thr	Lys	Lys	Tyr	Arg	Ile	Thr	Glu	Asn	Asp	Ile	Gln	Ile	
																2145
																2150
																2155
gca	tta	gat	gat	gcc	aaa	atc	aac	ttt	aat	gaa	aaa	cta	tct	caa	ctg	6650
Ala	Leu	Asp	Asp	Ala	Lys	Ile	Asn	Phe	Asn	Glu	Lys	Leu	Ser	Gln	Leu	
																2160
																2165
																2170
cag	aca	tat	atg	ata	caa	ttt	gat	cag	tat	att	aaa	gat	agt	tat	gat	6698
Gln	Thr	Tyr	Met	Ile	Gln	Phe	Asp	Gln	Tyr	Ile	Lys	Asp	Ser	Tyr	Asp	
																2175
																2180
																2185
																2190
tta	cat	gat	ttg	aaa	ata	gct	att	gct	aat	att	att	gat	gaa	atc	att	6746
Leu	His	Asp	Leu	Lys	Ile	Ala	Ile	Ala	Asn	Ile	Ile	Asp	Glu	Ile	Ile	
																2195
																2200
																2205
gaa	aaa	tta	aaa	agt	ctt	gat	gag	cac	tat	cat	atc	cgt	gta	aat	tta	6794
Glu	Lys	Leu	Lys	Ser	Leu	Asp	Glu	His	Tyr	His	Ile	Arg	Val	Asn	Leu	
																2210
																2215
																2220
gta	aaa	aca	atc	cat	gat	cta	cat	ttg	ttt	att	gaa	aat	att	gat	ttt	6842
Val	Lys	Thr	Ile	His	Asp	Leu	His	Leu	Phe	Ile	Glu	Asn	Ile	Asp	Phe	
																2225
																2230
																2235
aac	aaa	agt	gga	agt	agt	act	gca	tcc	tgg	att	caa	aat	gtg	gat	act	6890
Asn	Lys	Ser	Gly	Ser	Ser	Thr	Ala	Ser	Trp	Ile	Gln	Asn	Val	Asp	Thr	
																2240
																2245
																2250
aag	tac	caa	atc	aga	atc	cag	ata	caa	gaa	aaa	ctg	cag	cag	ctt	aag	6938
Lys	Tyr	Gln	Ile	Arg	Ile	Gln	Ile	Gln	Glu	Lys	Leu	Gln	Gln	Leu	Lys	
																2255
																2260
																2265
																2270
aga	cac	ata	cag	aat	ata	gac	atc	cag	cac	cta	gct	gga	aag	tta	aaa	6986
Arg	His	Ile	Gln	Asn	Ile	Asp	Ile	Gln	His	Leu	Ala	Gly	Lys	Leu	Lys	
																2275
																2280
																2285

caa cac att gag gct att gat gtt aga gtg ctt tta gat caa ttg gga Gln His Ile Glu Ala Ile Asp Val Arg Val Leu Leu Asp Gln Leu Gly	7034
2290 2295 2300	
act aca att tca ttt gaa aga ata aat gat gtt ctt gag cat gtc aaa Thr Thr Ile Ser Phe Glu Arg Ile Asn Asp Val Leu Glu His Val Lys	7082
2305 2310 2315	
cac ttt gtt ata aat ctt att ggg gat ttt gaa gta gct gag aaa atc His Phe Val Ile Asn Leu Ile Gly Asp Phe Glu Val Ala Glu Lys Ile	7130
2320 2325 2330	
aat gcc ttc aga gcc aaa gtc cat gag tta atc gag agg tat gaa gta Asn Ala Phe Arg Ala Lys Val His Glu Leu Ile Glu Arg Tyr Glu Val	7178
2335 2340 2345 2350	
gac caa caa atc cag gtt tta atg gat aaa tta gta gag ttg acc cac Asp Gln Gln Ile Gln Val Leu Met Asp Lys Leu Val Glu Leu Thr His	7226
2355 2360 2365	
caa tac aag ttg aag gag act att cag aag cta agc aat gtc cta caa Gln Tyr Lys Leu Lys Glu Thr Ile Gln Lys Leu Ser Asn Val Leu Gln	7274
2370 2375 2380	
caa gtt aag ata aaa gat tac ttt gag aaa ttg gtt gga ttt att gat Gln Val Lys Ile Lys Asp Tyr Phe Glu Lys Leu Val Gly Phe Ile Asp	7322
2385 2390 2395	
gat gct gtg aag aag ctt aat gaa tta tct ttt aaa aca ttc att gaa Asp Ala Val Lys Lys Leu Asn Glu Leu Ser Phe Lys Thr Phe Ile Glu	7370
2400 2405 2410	
gat gtt aac aaa ttc ctt gac atg ttg ata aag aaa tta aag tca ttt Asp Val Asn Lys Phe Leu Asp Met Leu Ile Lys Lys Leu Lys Ser Phe	7418
2415 2420 2425 2430	
gat tac cac cag ttt gta gat gaa acc aat gac aaa atc cgt gag gtg Asp Tyr His Gln Phe Val Asp Glu Thr Asn Asp Lys Ile Arg Glu Val	7466
2435 2440 2445	
act cag aga ctc aat ggt gaa att cag gct ctg gaa cta cca caa aaa Thr Gln Arg Leu Asn Gly Glu Ile Gln Ala Leu Glu Leu Pro Gln Lys	7514
2450 2455 2460	
gct gaa gca tta aaa ctg ttt tta gag gaa acc aag gcc aca gtt gca Ala Glu Ala Leu Lys Leu Phe Leu Glu Glu Thr Lys Ala Thr Val Ala	7562
2465 2470 2475	
gtg tat ctg gaa agc cta cag gac acc aaa ata acc tta atc atc aat Val Tyr Leu Glu Ser Leu Gln Asp Thr Lys Ile Thr Leu Ile Ile Asn	7610
2480 2485 2490	
tgg tta cag gag gct tta agt tca gca tct ttg gct cac atg aag gcc Trp Leu Gln Glu Ala Leu Ser Ser Ala Ser Leu Ala His Met Lys Ala	7658
2495 2500 2505 2510	
aaa ttc cga gag act cta gaa gat aca cga gac cga atg tat caa atg Lys Phe Arg Glu Thr Leu Glu Asp Thr Arg Asp Arg Met Tyr Gln Met	7706
2515 2520 2525	
gac att cag cag gaa ctt caa cga tac ctg tct ctg gta ggc cag gtt	7754

Asp Ile Gln Gln Glu Leu Gln Arg Tyr Leu Ser Leu Val Gly Gln Val			
2530	2535	2540	
tat agc aca ctt gtc acc tac att tct gat tgg tgg act ctt gct gct			7802
Tyr Ser Thr Leu Val Thr Tyr Ile Ser Asp Trp Trp Thr Leu Ala Ala			
2545	2550	2555	
aag aac ctt act gac ttt gca gag caa tat tct atc caa gat tgg gct			7850
Lys Asn Leu Thr Asp Phe Ala Glu Gln Tyr Ser Ile Gln Asp Trp Ala			
2560	2565	2570	
aaa cgt atg aaa gca ttg gta gag caa ggg ttc act gtt cct gaa atc			7898
Lys Arg Met Lys Ala Leu Val Glu Gln Gly Phe Thr Val Pro Glu Ile			
2575	2580	2585	2590
aag acc atc ctt ggg acc atg cct gcc ttt gaa gtc agt ctt cag gct			7946
Lys Thr Ile Leu Gly Thr Met Pro Ala Phe Glu Val Ser Leu Gln Ala			
2595	2600	2605	
ctt cag aaa gct acc ttc cag aca cct gat ttt ata gtc ccc cta aca			7994
Leu Gln Lys Ala Thr Phe Gln Thr Pro Asp Phe Ile Val Pro Leu Thr			
2610	2615	2620	
gat ttg agg att cca tca gtt cag ata aac ttc aaa gac tta aaa aat			8042
Asp Leu Arg Ile Pro Ser Val Gln Ile Asn Phe Lys Asp Leu Lys Asn			
2625	2630	2635	
ata aaa atc cca tcc agg ttt tcc aca cca gaa ttt acc atc ctt aac			8090
Ile Lys Ile Pro Ser Arg Phe Ser Thr Pro Glu Phe Thr Ile Leu Asn			
2640	2645	2650	
acc ttc cac att cct tcc ttt aca att gac ttt gtc gaa atg aaa gta			8138
Thr Phe His Ile Pro Ser Phe Thr Ile Asp Phe Val Glu Met Lys Val			
2655	2660	2665	2670
aag atc atc aga acc att gac cag atg cag aac agt gag ctg cag tgg			8186
Lys Ile Ile Arg Thr Ile Asp Gln Met Gln Asn Ser Glu Leu Gln Trp			
2675	2680	2685	
ccc gtt cca gat ata tat ctc agg gat ctg aag gtg gag gac att cct			8234
Pro Val Pro Asp Ile Tyr Leu Arg Asp Leu Lys Val Glu Asp Ile Pro			
2690	2695	2700	
cta gcg aga atc acc ctc cca gac ttc cgt tta cca gaa atc gca att			8282
Leu Ala Arg Ile Thr Leu Pro Asp Phe Arg Leu Pro Glu Ile Ala Ile			
2705	2710	2715	
cca gaa ttc ata atc cca act ctc aac ctt aat gat ttt caa gtt cct			8330
Pro Glu Phe Ile Ile Pro Thr Leu Asn Leu Asn Asp Phe Gln Val Pro			
2720	2725	2730	
gac ctt cac ata cca gaa ttc cag ctt ccc cac atc tca cac aca att			8378
Asp Leu His Ile Pro Glu Phe Gln Leu Pro His Ile Ser His Thr Ile			
2735	2740	2745	2750
gaa gta cct act ttt ggc aag cta tac agt att ctg aaa atc caa tct			8426
Glu Val Pro Thr Phe Gly Lys Leu Tyr Ser Ile Leu Lys Ile Gln Ser			
2755	2760	2765	
cct ctt ttc aca tta gat gca aat gct gac ata ggg aat gga acc acc			8474
Pro Leu Phe Thr Leu Asp Ala Asn Ala Asp Ile Gly Asn Gly Thr Thr			

2770	2775	2780	
tca gca aac gaa gca ggt atc gca gct tcc atc act gcc aaa gga gag Ser Ala Asn Glu Ala Gly Ile Ala Ala Ser Ile Thr Ala Lys Gly Glu 2785	2790	2795	8522
tcc aaa tta gaa gtt ctc aat ttt gat ttt caa gca aat gca caa ctc Ser Lys Leu Glu Val Leu Asn Phe Asp Phe Gln Ala Asn Ala Gln Leu 2800	2805	2810	8570
tca aac cct aag att aat ccg ctg gct ctg aag gag tca gtg aag ttc Ser Asn Pro Lys Ile Asn Pro Leu Ala Leu Lys Glu Ser Val Lys Phe 2815	2820	2825	2830
tcc agc aag tac ctg aga acg gag cat ggg agt gaa atg ctg ttt ttt Ser Ser Lys Tyr Leu Arg Thr Glu His Gly Ser Glu Met Leu Phe Phe 2835	2840	2845	8666
gga aat gct att gag gga aaa tca aac aca gtg gca agt tta cac aca Gly Asn Ala Ile Glu Gly Lys Ser Asn Thr Val Ala Ser Leu His Thr 2850	2855	2860	8714
gaa aaa aat aca ctg gag ctt agt aat gga gtg att gtc aag ata aac Glu Lys Asn Thr Leu Glu Leu Ser Asn Gly Val Ile Val Lys Ile Asn 2865	2870	2875	8762
aat cag ctt acc ctg gat agc aac act aaa tac ttc cac aaa ttg aac Asn Gln Leu Thr Leu Asp Ser Asn Thr Lys Tyr Phe His Lys Leu Asn 2880	2885	2890	8810
atc ccc aaa ctg gac ttc tct agt cag gct gac ctg cgc aac gag atc Ile Pro Lys Leu Asp Phe Ser Ser Gln Ala Asp Leu Arg Asn Glu Ile 2895	2900	2905	2910
aag aca ctg ttg aaa gct ggc cac ata gca tgg act tct tct gga aaa Lys Thr Leu Leu Lys Ala Gly His Ile Ala Trp Thr Ser Ser Gly Lys 2915	2920	2925	8906
ggg tca tgg aaa tgg gcc tgc ccc aga ttc tca gat gag gga aca cat Gly Ser Trp Lys Trp Ala Cys Pro Arg Phe Ser Asp Glu Gly Thr His 2930	2935	2940	8954
gaa tca caa att agt ttc acc ata gaa gga ccc ctc act tcc ttt gga Glu Ser Gln Ile Ser Phe Thr Ile Glu Gly Pro Leu Thr Ser Phe Gly 2945	2950	2955	9002
ctg tcc aat aag atc aat agc aaa cac cta aga gta aac caa aac ttg Leu Ser Asn Lys Ile Asn Ser Lys His Leu Arg Val Asn Gln Asn Leu 2960	2965	2970	9050
gtt tat gaa tct ggc tcc ctc aac ttt tct aaa ctt gaa att caa tca Val Tyr Glu Ser Gly Ser Leu Asn Phe Ser Lys Leu Glu Ile Gln Ser 2975	2980	2985	2990
caa gtc gat tcc cag cat gtg ggc cac agt gtt cta act gct aaa ggc Gln Val Asp Ser Gln His Val Gly His Ser Val Leu Thr Ala Lys Gly 2995	3000	3005	9146
atg gca ctg ttt gga gaa ggg aag gca gag ttt act ggg agg cat gat Met Ala Leu Phe Gly Glu Gly Lys Ala Glu Phe Thr Gly Arg His Asp 3010	3015	3020	9194
gct cat tta aat gga aag gtt att gga act ttg aaa aat tct ctt ttc			9242

Ala His Leu Asn Gly Lys Val Ile Gly Thr Leu Lys Asn Ser Leu Phe		
3025	3030	3035
ttt tca gcc cag cca ttt gag atc acg gca tcc aca aac aat gaa ggg		9290
Phe Ser Ala Gln Pro Phe Glu Ile Thr Ala Ser Thr Asn Asn Glu Gly		
3040	3045	3050
aat ttg aaa gtt cgt ttt cca tta agg tta aca ggg aag ata gac ttc		9338
Asn Leu Lys Val Arg Phe Pro Leu Arg Leu Thr Gly Lys Ile Asp Phe		
3055	3060	3065
ctg aat aac tat gca ctg ttt ctg agt ccc agt gcc cag caa gca agt		9386
Leu Asn Asn Tyr Ala Leu Phe Leu Ser Pro Ser Ala Gln Gln Ala Ser		
3075	3080	3085
tgg caa gta agt gct agg ttc aat cag tat aag tac aac caa aat ttc		9434
Trp Gln Val Ser Ala Arg Phe Asn Gln Tyr Lys Tyr Asn Gln Asn Phe		
3090	3095	3100
tct gct gga aac aac gag aac att atg gag gcc cat gta gga ata aat		9482
Ser Ala Gly Asn Asn Glu Asn Ile Met Glu Ala His Val Gly Ile Asn		
3105	3110	3115
gga gaa gca aat ctg gat ttc tta aac att cct tta aca att cct gaa		9530
Gly Glu Ala Asn Leu Asp Phe Leu Asn Ile Pro Leu Thr Ile Pro Glu		
3120	3125	3130
atg cgt cta cct tac aca ata atc aca act cct cca ctg aaa gat ttc		9578
Met Arg Leu Pro Tyr Thr Ile Ile Thr Thr Pro Pro Leu Lys Asp Phe		
3135	3140	3145
tct cta tgg gaa aaa aca ggc ttg aag gaa ttc ttg aaa acg aca aag		9626
Ser Leu Trp Glu Lys Thr Gly Leu Lys Glu Phe Leu Lys Thr Thr Lys		
3155	3160	3165
caa tca ttt gat tta agt gta aaa gct cag tat aag aaa aac aaa cac		9674
Gln Ser Phe Asp Leu Ser Val Lys Ala Gln Tyr Lys Lys Asn Lys His		
3170	3175	3180
agg cat tcc atc aca aat cct ttg gct gtg ctt tgt gag ttt atc agt		9722
Arg His Ser Ile Thr Asn Pro Leu Ala Val Leu Cys Glu Phe Ile Ser		
3185	3190	3195
cag agc atc aaa tcc ttt gac agg cat ttt gaa aaa aac aga aac aat		9770
Gln Ser Ile Lys Ser Phe Asp Arg His Phe Glu Lys Asn Arg Asn Asn		
3200	3205	3210
gca tta gat ttt gtc acc aaa tcc tat aat gaa aca aaa att aag ttt		9818
Ala Leu Asp Phe Val Thr Lys Ser Tyr Asn Glu Thr Lys Ile Lys Phe		
3215	3220	3225
gat aag tac aaa gct gaa aaa tct cac gac gag ctc ccc agg acc ttt		9866
Asp Lys Tyr Lys Ala Glu Lys Ser His Asp Glu Leu Pro Arg Thr Phe		
3235	3240	3245
caa att cct gga tac act gtt cca gtt gtc aat gtt gaa gtg tct cca		9914
Gln Ile Pro Gly Tyr Thr Val Pro Val Val Asn Val Glu Val Ser Pro		
3250	3255	3260
ttc acc ata gag atg tcg gca ttc ggc tat gtg ttc cca aaa gca gtc		9962
Phe Thr Ile Glu Met Ser Ala Phe Gly Tyr Val Phe Pro Lys Ala Val		

3265

3270

3275

agc atg cct agt ttc tcc atc cta ggt tct gac gtc cgt gtg cct tca Ser Met Pro Ser Phe Ser Ile Leu Gly Ser Asp Val Arg Val Pro Ser 3280	3285	3290	10010
tac aca tta atc ctg cca tca tta gag ctg cca gtc ctt cat gtc cct Tyr Thr Leu Ile Leu Pro Ser Leu Glu Leu Pro Val Leu His Val Pro 3295	3300	3305	10058
aga aat ctc aag ctt tct ctt cca cat ttc aag gaa ttg tgt acc ata Arg Asn Leu Lys Leu Ser Leu Pro His Phe Lys Glu Leu Cys Thr Ile 3315	3320	3325	10106
agc cat att ttt att cct gcc atg ggc aat att acc tat gat ttc tcc Ser His Ile Phe Ile Pro Ala Met Gly Asn Ile Thr Tyr Asp Phe Ser 3330	3335	3340	10154
ttt aaa tca agt gtc atc aca ctg aat acc aat gct gaa ctt ttt aac Phe Lys Ser Ser Val Ile Thr Leu Asn Thr Asn Ala Glu Leu Phe Asn 3345	3350	3355	10202
cag tca gat att gtt gct cat ctc ctt tct tca tct tca tct gtc att Gln Ser Asp Ile Val Ala His Leu Leu Ser Ser Ser Ser Val Ile 3360	3365	3370	10250
gat gca ctg cag tac aaa tta gag ggc acc aca aga ttg aca aga aaa Asp Ala Leu Gln Tyr Lys Leu Glu Gly Thr Thr Arg Leu Thr Arg Lys 3375	3380	3385	10298
agg gga ttg aag tta gcc aca gct ctg tct ctg agc aac aaa ttt gtg Arg Gly Leu Lys Leu Ala Thr Ala Leu Ser Leu Ser Asn Lys Phe Val 3395	3400	3405	10346
gag ggt agt cat aac agt act gtg agc tta acc acg aaa aat atg gaa Glu Gly Ser His Asn Ser Thr Val Ser Leu Thr Thr Lys Asn Met Glu 3410	3415	3420	10394
gtg tca gtg gca aaa acc aca aaa gcc gaa att cca att ttg aga atg Val Ser Val Ala Lys Thr Thr Lys Ala Glu Ile Pro Ile Leu Arg Met 3425	3430	3435	10442
aat ttc aag caa gaa ctt aat gga aat acc aag tca aaa cct act gtc Asn Phe Lys Gln Glu Leu Asn Gly Asn Thr Lys Ser Lys Pro Thr Val 3440	3445	3450	10490
tct tcc tcc atg gaa ttt aag tat gat ttc aat tct tca atg ctg tac Ser Ser Ser Met Glu Phe Lys Tyr Asp Phe Asn Ser Ser Met Leu Tyr 3455	3460	3465	10538
tct acc gct aaa gga gca gtt gac cac aag ctt agc ttg gaa agc ctc Ser Thr Ala Lys Gly Ala Val Asp His Lys Leu Ser Leu Glu Ser Leu 3475	3480	3485	10586
acc tct tac ttt tcc att gag tca tct acc aaa gga gat gtc aag ggt Thr Ser Tyr Phe Ser Ile Glu Ser Ser Thr Lys Gly Asp Val Lys Gly 3490	3495	3500	10634
tcg gtt ctt tct cgg gaa tat tca gga act att gct agt gag gcc aac Ser Val Leu Ser Arg Glu Tyr Ser Gly Thr Ile Ala Ser Glu Ala Asn 3505	3510	3515	10682
act tac ttg aat tcc aag agc aca cgg tct tca gtg aag ctg cag ggc			10730

Thr Tyr Leu Asn Ser Lys Ser Thr Arg Ser Ser Val Lys Leu Gln Gly			
3520	3525	3530	
act tcc aaa att gat gat atc tgg aac ctt gaa gta aaa gaa aat ttt			10778
Thr Ser Lys Ile Asp Asp Ile Trp Asn Leu Glu Val Lys Glu Asn Phe			
3535	3540	3545	3550
gct gga gaa gcc aca ctc caa cgc ata tat tcc ctc tgg gag cac agt			10826
Ala Gly Glu Ala Thr Leu Gln Arg Ile Tyr Ser Leu Trp Glu His Ser			
3555	3560	3565	
acg aaa aac cac tta cag cta gag ggc ctc ttt ttc acc aac gga gaa			10874
Thr Lys Asn His Leu Gln Leu Glu Gly Leu Phe Phe Thr Asn Gly Glu			
3570	3575	3580	
cat aca agc aaa gcc acc ctg gaa ctc tct cca tgg caa atg tca gct			10922
His Thr Ser Lys Ala Thr Leu Glu Leu Ser Pro Trp Gln Met Ser Ala			
3585	3590	3595	
cgt gtt cag gtc cat gca agt cag ccc agt tcc ttc cat gat ttc cct			10970
Leu Val Gln Val His Ala Ser Gln Pro Ser Ser Phe His Asp Phe Pro			
3600	3605	3610	
gac ctt ggc cag gaa gtg gcc ctg aat gct aac act aag aac cag aag			11018
Asp Leu Gly Gln Glu Val Ala Leu Asn Ala Asn Thr Lys Asn Gln Lys			
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atc aga tgg aaa aat gaa gtc cgg att cat tct ggg tct ttc cag agc			11066
Ile Arg Trp Lys Asn Glu Val Arg Ile His Ser Gly Ser Phe Gln Ser			
3635	3640	3645	
cag gtc gag ctt tcc aat gac caa gaa aag gca cac ctt gac att gca			11114
Gln Val Glu Leu Ser Asn Asp Gln Glu Lys Ala His Leu Asp Ile Ala			
3650	3655	3660	
gga tcc tta gaa gga cac cta agg ttc ctc aaa aat atc atc cta cca			11162
Gly Ser Leu Glu Gly His Leu Arg Phe Leu Lys Asn Ile Ile Leu Pro			
3665	3670	3675	
gtc tat gac aag agc tta tgg gat ttc cta aag ctg gat gta acc acc			11210
Val Tyr Asp Lys Ser Leu Trp Asp Phe Leu Lys Leu Asp Val Thr Thr			
3680	3685	3690	
agc att ggt agg aga cag cat ctt cgt gtt tca act gcc ttt gtg tac			11258
Ser Ile Gly Arg Arg Gln His Leu Arg Val Ser Thr Ala Phe Val Tyr			
3695	3700	3705	3710
acc aaa aac ccc aat ggc tat tca ttc tcc atc cct gta aaa gtt ttg			11306
Thr Lys Asn Pro Asn Gly Tyr Ser Phe Ser Ile Pro Val Lys Val Leu			
3715	3720	3725	
gct gat aaa ttc att act cct ggg ctg aaa cta aat gat cta aat tca			11354
Ala Asp Lys Phe Ile Thr Pro Gly Leu Lys Leu Asn Asp Leu Asn Ser			
3730	3735	3740	
gtt ctt gtc atg cct acg ttc cat gtc cca ttt aca gat ctt cag gtt			11402
Val Leu Val Met Pro Thr Phe His Val Pro Phe Thr Asp Leu Gln Val			
3745	3750	3755	

cca tcg tgc aaa ctt gac ttc aga gaa ata caa atc tat aag aag ctg Pro Ser Cys Lys Leu Asp Phe Arg Glu Ile Gln Ile Tyr Lys Lys Leu	3760	3765	3770	11450	
aga act tca tca ttt gcc ctc aac cta cca aca ctc ccc gag gta aaa Arg Thr Ser Ser Phe Ala Leu Asn Leu Pro Thr Leu Pro Glu Val Lys	3775	3780	3785	3790	11498
ttc cct gaa gtt gat gtg tta aca aaa tat tct caa cca gaa gac tcc Phe Pro Glu Val Asp Val Leu Thr Lys Tyr Ser Gln Pro Glu Asp Ser	3795	3800	3805		11546
ttg att ccc ttt ttt gag ata acc gtg cct gaa tct cag tta act gtg Leu Ile Pro Phe Glu Ile Thr Val Pro Glu Ser Gln Leu Thr Val	3810	3815	3820		11594
tcc cag ttc acg ctt cca aaa agt gtt tca gat ggc att gct gct ttg Ser Gln Phe Thr Leu Pro Lys Ser Val Ser Asp Gly Ile Ala Ala Leu	3825	3830	3835		11642
gat cta aat gca gta gcc aac aag atc gca gac ttt gag ttg ccc acc Asp Leu Asn Ala Val Ala Asn Lys Ile Ala Asp Phe Glu Leu Pro Thr	3840	3845	3850		11690
atc atc gtg cct gag cag acc att gag att ccc tcc att aag ttc tct Ile Ile Val Pro Glu Gln Thr Ile Glu Ile Pro Ser Ile Lys Phe Ser	3855	3860	3865	3870	11738
gta cct gct gga att gtc att cct tcc ttt caa gca ctg act gca cgc Val Pro Ala Gly Ile Val Ile Pro Ser Phe Gln Ala Leu Thr Ala Arg	3875	3880	3885		11786
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aaa aac aaa gca gat tat gtt gaa aca gtc ctg gat tcc aca tgc agc Lys Asn Lys Ala Asp Tyr Val Glu Thr Val Leu Asp Ser Thr Cys Ser	3905	3910	3915		11882
tca acc gta cag ttc cta gaa tat gaa cta aat gtt ttg gga aca cac Ser Thr Val Gln Phe Leu Glu Tyr Glu Leu Asn Val Leu Gly Thr His	3920	3925	3930		11930
aaa atc gaa gat ggt acg tta gcc tct aag act aaa gga aca ctt gca Lys Ile Glu Asp Gly Thr Leu Ala Ser Lys Thr Lys Gly Thr Leu Ala	3935	3940	3945	3950	11978
cac cgt gac ttc agt gca gaa tat gaa gaa gat ggc aaa ttt gaa gga His Arg Asp Phe Ser Ala Glu Tyr Glu Glu Asp Gly Lys Phe Glu Gly	3955	3960	3965		12026
ctt cag gaa tgg gaa gga aaa gcg cac ctc aat atc aaa agc cca gcg Leu Gln Glu Trp Glu Gly Lys Ala His Leu Asn Ile Lys Ser Pro Ala	3970	3975	3980		12074
ttc acc gat ctc cat ctg cgc tac cag aaa gac aag aaa ggc atc tcc Phe Thr Asp Leu His Leu Arg Tyr Gln Lys Asp Lys Lys Gly Ile Ser	3985	3990	3995		12122
acc tca gca gcc tcc cca gcc gta ggc acc gtg ggc atg gat atg gat Thr Ser Ala Ala Ser Pro Ala Val Gly Thr Val Gly Met Asp Met Asp					12170

4000	4005	4010	
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gct tct ggc ttg cta acc tct ctg aaa gac aac gtg ccc aag gcc aca Ala Ser Gly Leu Leu Thr Ser Leu Lys Asp Asn Val Pro Lys Ala Thr 4065 4070 4075			12362
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ctc acc ctg aga gaa gtg tct tca aag ctg aga aga aat ctg cag aac Leu Thr Leu Arg Glu Val Ser Ser Lys Leu Arg Arg Asn Leu Gln Asn 4095 4100 4105 4110			12458
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Phe Glu Leu Arg Lys His Lys Leu Ile Asp Val Ile Ser Met Tyr Arg				
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Glu Leu Leu Lys Asp Leu Ser Lys Glu Ala Gln Glu Val Phe Lys Ala				
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Ile Gln Ser Leu Lys Thr Thr Glu Val Leu Arg Asn Leu Gln Asp Leu				
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Leu Gln Phe Ile Phe Gln Leu Ile Glu Asp Asn Ile Lys Gln Leu Lys				
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Glu Met Lys Phe Thr Tyr Leu Ile Asn Tyr Ile Gln Asp Glu Ile Asn				
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aca atc ttc aat gat tat atc cca tat gtt ttt aaa ttg ttg aaa gaa				13178
Thr Ile Phe Asn Asp Tyr Ile Pro Tyr Val Phe Lys Leu Leu Lys Glu				
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aac cta tgc ctt aat ctt cat aag ttc aat gaa ttt att caa aac gag				13226
Asn Leu Cys Leu Asn Leu His Lys Phe Asn Glu Phe Ile Gln Asn Glu				
4355	4360	4365		
ctt cag gaa gct tct caa gag tta cag cag atc cat caa tac att atg				13274
Leu Gln Glu Ala Ser Gln Glu Leu Gln Ile His Gln Tyr Ile Met				
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gcc ctt cgt gaa gaa tat ttt gat cca agt ata gtt ggc tgg aca gtg				13322
Ala Leu Arg Glu Glu Tyr Phe Asp Pro Ser Ile Val Gly Trp Thr Val				
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Lys Tyr Tyr Glu Leu Glu Lys Ile Val Ser Leu Ile Lys Asn Leu				
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Leu Val Ala Leu Lys Asp Phe His Ser Glu Tyr Ile Val Ser Ala Ser				
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Asn Phe Thr Ser Gln Leu Ser Ser Gln Val Glu Gln Phe Leu His Arg				
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Asn Ile Gln Glu Tyr Leu Ser Ile Leu Thr Asp Pro Asp Gly Lys Gly				
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Lys Glu Lys Ile Ala Glu Leu Ser Ala Thr Ala Gln Glu Ile Ile Lys				
4465	4470	4475		
agc cag gcc att gcg acg aag aaa ata att tct gat tac cac cag cag				13610
Ser Gln Ala Ile Ala Thr Lys Lys Ile Ile Ser Asp Tyr His Gln Gln				
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Phe Arg Tyr Lys Leu Gln Asp Phe Ser Asp Gln Leu Ser Asp Tyr Tyr				

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 Leu Leu Leu Leu Leu Ala Gly Ala Arg Ala Glu Glu Glu Met Leu
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 gaa aat gtc agc ctg gtc tgt cca aaa gat gcg acc cga ttc aag cac 144
 Glu Asn Val Ser Leu Val Cys Pro Lys Asp Ala Thr Arg Phe Lys His
 35 40 45

 ctc cgg aag tac aca tac aac tat gag gct gag agt tcc agt gga gtc 192
 Leu Arg Lys Tyr Thr Asn Tyr Glu Ala Glu Ser Ser Ser Gly Val
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 cct ggg act gct gat tca aga agt gcc acc agg atc aac tgc aag gtt 240
 Pro Gly Thr Ala Asp Ser Arg Ser Ala Thr Arg Ile Asn Cys Lys Val
 65 70 75 80

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 Glu Leu Glu Val Pro Gln Leu Cys Ser Phe Ile Leu Lys Thr Ser Gln
 85 90 95

 tgc acc ctg aaa gag gtg tat ggc ttc aac cct gag ggc aaa gcc ttg 336
 Cys Thr Leu Lys Glu Val Tyr Gly Phe Asn Pro Glu Gly Lys Ala Leu
 100 105 110

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 Leu Lys Thr Lys Asn Ser Glu Glu Phe Ala Ala Ala Met Ser Arg
 115 120 125

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 Tyr Glu Leu Lys Leu Ala Ile Pro Glu Gly Lys Gln Val Phe Leu Tyr
 130 135 140

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 Pro Glu Lys Asp Glu Pro Thr Tyr Ile Leu Asn Ile Lys Arg Gly Ile
 145 150 155 160

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ctg ggg cag tgt gat cgc ttc aag ccc atc cgc aca ggc atc agc cca Leu Gly Gln Cys Asp Arg Phe Lys Pro Ile Arg Thr Gly Ile Ser Pro	210 215 220	672
ctt gct ctc atc aaa ggc atg acc cgc ccc ttg tca act ctg atc agc Leu Ala Leu Ile Lys Gly Met Thr Arg Pro Leu Ser Thr Leu Ile Ser	225 230 235	720
agc agc cag tcc tgt cag tac aca ctg gac gct aag agg aag cat gtg Ser Ser Gln Ser Cys Gln Tyr Thr Leu Asp Ala Lys Arg Lys His Val	245 250 255	768
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cag gcc gaa gct gtt ttg aag act ctc cag gaa ctg aaa aaa cta acc Gln Ala Glu Ala Val Leu Lys Thr Leu Gln Glu Leu Lys Lys Leu Thr	325 330 335	1008
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act gag ctg aga ggc ctc agt gat gaa gca gtc aca tct ctc ttg cca Thr Glu Leu Arg Gly Leu Ser Asp Glu Ala Val Thr Ser Leu Leu Pro	355 360 365	1104
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cca act gtc atg gac ttc aga aaa ttc tct ccg aac tat caa ctc tac Pro Thr Val Met Asp Phe Arg Lys Phe Ser Arg Asn Tyr Gln Leu Tyr 625 630 635 640	1920
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Tyr Asp Glu Glu Lys Ile Glu Phe Glu Trp Asn Thr Gly Thr Asn Val			
1170	1175	1180	
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Asp Thr Lys Lys Met Thr Ser Asn Phe Pro Val Asp Leu Ser Asp Tyr			
1185	1190	1195	1200
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Pro Lys Ser Leu His Met Tyr Ala Asn Arg Leu Leu Asp His Arg Val			
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Pro Gln Thr Asp Met Thr Phe Arg His Val Gly Ser Lys Leu Ile Val			
1220	1225	1230	
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Ala Met Ser Ser Trp Leu Gln Lys Ala Ser Gly Ser Leu Pro Tyr Thr			
1235	1240	1245	
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Gln Thr Leu Gln Asp His Leu Asn Ser Leu Lys Glu Phe Asn Leu Gln			
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Asn Met Gly Leu Pro Asp Ser His Ile Pro Glu Asn Leu Phe Leu Lys			
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Glu Ile Pro Leu Pro Phe Gly Gly Lys Ser Ser Arg Asp Leu Lys Met			
1300	1305	1310	
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Leu Glu Thr Val Arg Thr Pro Ala Leu His Phe Lys Ser Val Gly Phe			
1315	1320	1325	
cat ctg cca tct cga gag ttc caa gtc cct act ttt acc att ccc aag		4032	
His Leu Pro Ser Arg Glu Phe Gln Val Pro Thr Phe Thr Ile Pro Lys			
1330	1335	1340	
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Thr Asp Lys Ile Asn Ser Gly Ala His Lys Ala Thr Leu Arg Ile Gly			
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Gln Asp Gly Ile Ser Thr Ser Ala Thr Thr Asn Leu Lys Cys Ser Leu			
1650	1655	1660	
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Leu Val Leu Glu Asn Glu Leu Asn Ala Glu Leu Gly Leu Ser Gly Ala			
1665	1670	1675	1680
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Ser Met Lys Leu Thr Thr Asn Gly Arg Phe Arg Glu His Asn Ala Lys			
1685	1690	1695	
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Phe Ser Leu Asp Gly Lys Ala Ala Leu Thr Glu Leu Ser Leu Gly Ser			
1700	1705	1710	
gct tat cag gcc atg att ctg ggt gtc gac agc aaa aac att ttc aac		5184	
Ala Tyr Gln Ala Met Ile Leu Gly Val Asp Ser Lys Asn Ile Phe Asn			
1715	1720	1725	
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Ser Tyr Ala Glu Met Lys Phe Asp His Thr Asn Ser Leu Asn Ile Ala			
1745	1750	1755	1760
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1765	1770	1775	
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Asp Lys Phe Tyr Lys Gln Thr Val Asn Leu Gln Leu Gln Pro Tyr Ser			
1780	1785	1790	
ctg gta act act tta aac agt gac ctg aaa tac aat gct ctg gat ctc		5424	
Leu Val Thr Thr Leu Asn Ser Asp Leu Lys Tyr Asn Ala Leu Asp Leu			
1795	1800	1805	
acc aac aat ggg aaa cta cgg cta gaa ccc ctg aag ctg cat gtg gct		5472	
Thr Asn Asn Gly Lys Leu Arg Leu Glu Pro Leu Lys Leu His Val Ala			
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Gly Asn Leu Lys Gly Ala Tyr Gln Asn Asn Glu Ile Lys His Ile Tyr			
1825	1830	1835	1840
gcc atc tct tct gct gcc tta tca gca agc tat aaa gca gac act gtt		5568	
Ala Ile Ser Ser Ala Ala Leu Ser Ala Ser Tyr Lys Ala Asp Thr Val			
1845	1850	1855	
gct aag gtt cag ggt gtg gag ttt agc cat ggg ctc aac aca gac atc		5616	
Ala Lys Val Gln Gly Val Glu Phe Ser His Gly Leu Asn Thr Asp Ile			
1860	1865	1870	
gct ggg ctg gct tca gcc att gac atg agc aca aac tat aat tca gac		5664	
Ala Gly Leu Ala Ser Ala Ile Asp Met Ser Thr Asn Tyr Asn Ser Asp			
1875	1880	1885	

tca ctg cat ttc agc aat gtc ttc cgt tct gta atg gcc ccg ttt acc Ser Leu His Phe Ser Asn Val Phe Arg Ser Val Met Ala Pro Phe Thr 1890 1895 1900	5712
atg acc atc gat gca cat aca aat ggc aat ggg aaa ctc gct ctc tgg Met Thr Ile Asp Ala His Thr Asn Gly Asn Gly Lys Leu Ala Leu Trp 1905 1910 1915 1920	5760
gga gaa cat act ggg cag ctg tat agc aaa ttc ctg ttg aaa gca gaa Gly Glu His Thr Gly Gln Leu Tyr Ser Lys Phe Leu Leu Lys Ala Glu 1925 1930 1935	5808
cct ctg gca ttt act ttc tct cat gat tac aaa ggc tcc aca agt cat Pro Leu Ala Phe Thr Phe Ser His Asp Tyr Lys Gly Ser Thr Ser His 1940 1945 1950	5856
cat ctc gtg tct agg aaa agc atc agt gca gct ctt gaa cac aaa gtc His Leu Val Ser Arg Lys Ser Ile Ser Ala Ala Leu Glu His Lys Val 1955 1960 1965	5904
agt gcc ctg ctt act cca gct gag cag aca ggc acc tgg aaa ctc aag Ser Ala Leu Leu Thr Pro Ala Glu Gln Thr Gly Thr Trp Lys Leu Lys 1970 1975 1980	5952
acc caa ttt aac aac aat gaa tac agc cag gac ttg gat gct tac aac Thr Gln Phe Asn Asn Asn Glu Tyr Ser Gln Asp Leu Asp Ala Tyr Asn 1985 1990 1995 2000	6000
act aaa gat aaa att ggc gtg gag ctt act gga cga act ctg gct gac Thr Lys Asp Lys Ile Gly Val Glu Leu Thr Gly Arg Thr Leu Ala Asp 2005 2010 2015	6048
cta act cta cta gac tcc cca att aaa gtg cca ctt tta ctc agt gag Leu Thr Leu Leu Asp Ser Pro Ile Lys Val Pro Leu Leu Leu Ser Glu 2020 2025 2030	6096
ccc atc aat atc aat gat gct tta gag atg aga gat gcc gtt gag aag Pro Ile Asn Ile Asn Asp Ala Leu Glu Met Arg Asp Ala Val Glu Lys 2035 2040 2045	6144
ccc caa gaa ttt aca att gtt gct ttt gta aag tat gat aaa aac caa Pro Gln Glu Phe Thr Ile Val Ala Phe Val Lys Tyr Asp Lys Asn Gln 2050 2055 2060	6192
gat gtt cac tcc att aac ctc cca ttt ttt gag acc ttg caa gaa tat Asp Val His Ser Ile Asn Leu Pro Phe Phe Glu Thr Leu Gln Glu Tyr 2065 2070 2075 2080	6240
ttt gag agg aat cga caa acc att ata gtt gta ctg gaa aac gta cag Phe Glu Arg Asn Arg Gln Thr Ile Ile Val Val Leu Glu Asn Val Gln 2085 2090 2095	6288
aga aac ctg aag cac atc aat att gat caa ttt gta aga aaa tac aga Arg Asn Leu Lys His Ile Asn Ile Asp Gln Phe Val Arg Lys Tyr Arg 2100 2105 2110	6336
gca gcc ctg gga aaa ctc cca cag caa gct aat gat tat ctg aat tca Ala Ala Leu Gly Lys Leu Pro Gln Gln Ala Asn Asp Tyr Leu Asn Ser 2115 2120 2125	6384
ttc aat tgg gag aga caa gtt tca cat gcc aag gag aaa ctg act gct	6432

Phe Asn Trp Glu Arg Gln Val Ser His Ala Lys Glu Lys Leu Thr Ala			
2130	2135	2140	
ctc aca aaa aag tat aga att aca gaa aat gat ata caa att gca tta			6480
Leu Thr Lys Lys Tyr Arg Ile Thr Glu Asn Asp Ile Gln Ile Ala Leu			
2145	2150	2155	2160
gat gat gcc aaa atc aac ttt aat gaa aaa cta tct caa ctg cag aca			6528
Asp Asp Ala Lys Ile Asn Phe Asn Glu Lys Leu Ser Gln Leu Gln Thr			
2165	2170	2175	
tat atg ata caa ttt gat cag tat att aaa gat agt tat gat tta cat			6576
Tyr Met Ile Gln Phe Asp Gln Tyr Ile Lys Asp Ser Tyr Asp Leu His			
2180	2185	2190	
gat ttg aaa ata gct att gct aat att att gat gaa atc att gaa aaa			6624
Asp Leu Lys Ile Ala Ile Ala Asn Ile Ile Asp Glu Ile Ile Glu Lys			
2195	2200	2205	
tta aaa agt ctt gat gag cac tat cat acc cgt gta aat tta gta aaa			6672
Leu Lys Ser Leu Asp Glu His Tyr His Thr Arg Val Asn Leu Val Lys			
2210	2215	2220	
aca atc cat gat cta cat ttg ttt att gaa aat att gat ttt aac aaa			6720
Thr Ile His Asp Leu His Leu Phe Ile Glu Asn Ile Asp Phe Asn Lys			
2225	2230	2235	2240
agt gga agt agt act gca tcc tgg att caa aat gtg gat act aag tac			6768
Ser Gly Ser Ser Thr Ala Ser Trp Ile Gln Asn Val Asp Thr Lys Tyr			
2245	2250	2255	
caa atc aga atc cag ata caa gaa aaa ctg cag cag ctt aag aga cac			6816
Gln Ile Arg Ile Gln Ile Glu Lys Leu Gln Gln Leu Lys Arg His			
2260	2265	2270	
ata cag aat ata gac atc cag cac cta gct gga aag tta aaa caa cac			6864
Ile Gln Asn Ile Asp Ile Gln His Leu Ala Gly Lys Leu Lys Gln His			
2275	2280	2285	
att gag gct att gat gtt aga gtg ctt tta gat caa ttg gga act aca			6912
Ile Glu Ala Ile Asp Val Arg Val Leu Leu Asp Gln Leu Gly Thr Thr			
2290	2295	2300	
att tca ttt gaa aga ata aat gat gtt ctt gag cat gtc aaa cac ttt			6960
Ile Ser Phe Glu Arg Ile Asn Asp Val Leu Glu His Val Lys His Phe			
2305	2310	2315	2320
gtt ata aat ctt att ggg gat ttt gaa gta gct gag aaa atc aat gcc			7008
Val Ile Asn Leu Ile Gly Asp Phe Glu Val Ala Glu Lys Ile Asn Ala			
2325	2330	2335	
ttc aga gcc aaa gtc cat gag tta atc gag agg tat gaa gta gac caa			7056
Phe Arg Ala Lys Val His Glu Leu Ile Glu Arg Tyr Glu Val Asp Gln			
2340	2345	2350	
caa atc cag gtt tta atg gat aaa tta gta gag ttg gcc cac caa tac			7104
Gln Ile Gln Val Leu Met Asp Lys Leu Val Glu Leu Ala His Gln Tyr			
2355	2360	2365	
aag ttg aag gag act att cag aag cta agc aat gtc cta caa caa gtt			7152
Lys Leu Lys Glu Thr Ile Gln Lys Leu Ser Asn Val Leu Gln Gln Val			
2370	2375	2380	

aag ata aaa gat tac ttt gag aaa ttg gtt gga ttt att gat gat gct Lys Ile Lys Asp Tyr Phe Glu Lys Leu Val Gly Phe Ile Asp Asp Ala 2385 2390 2395 2400	7200
gtc aag aag ctt aat gaa tta tct ttt aaa aca ttc att gaa gat gtt Val Lys Lys Leu Asn Glu Leu Ser Phe Lys Thr Phe Ile Glu Asp Val 2405 2410 2415	7248
aac aaa ttc ctt gac atg ttg ata aag aaa tta aag tca ttt gat tac Asn Lys Phe Leu Asp Met Leu Ile Lys Lys Leu Lys Ser Phe Asp Tyr 2420 2425 2430	7296
cac cag ttt gta gat gaa acc aat gac aaa atc cgt gag gtg act cag His Gln Phe Val Asp Glu Thr Asn Asp Lys Ile Arg Glu Val Thr Gln 2435 2440 2445	7344
aga ctc aat ggt gaa att cag gct ctg gaa cta cca caa aaa gct gaa Arg Leu Asn Gly Glu Ile Gln Ala Leu Glu Leu Pro Gln Lys Ala Glu 2450 2455 2460	7392
gca tta aaa ctg ttt tta gag gaa acc aag gcc aca gtt gca gtg tat Ala Leu Lys Leu Phe Leu Glu Glu Thr Lys Ala Thr Val Ala Val Tyr 2465 2470 2475 2480	7440
ctg gaa agc cta cag gac acc aaa ata acc tta atc atc aat tgg tta Leu Glu Ser Leu Gln Asp Thr Lys Ile Thr Leu Ile Ile Asn Trp Leu 2485 2490 2495	7488
cag gag gct tta agt tca gca tct ttg gct cac atg aag gcc aaa ttc Gln Glu Ala Leu Ser Ser Ala Ser Leu Ala His Met Lys Ala Lys Phe 2500 2505 2510	7536
cga gag act cta gaa gat aca cga gac cga atg tat caa atg gac att Arg Glu Thr Leu Glu Asp Thr Arg Asp Arg Met Tyr Gln Met Asp Ile 2515 2520 2525	7584
cag gag gaa ctt caa cga tac ctg tct ctg gta ggc cag gtt tat agc Gln Gln Glu Leu Gln Arg Tyr Leu Ser Leu Val Gly Gln Val Tyr Ser 2530 2535 2540	7632
aca ctt gtc acc tac att tct gat tgg tgg act ctt gct gct aag aac Thr Leu Val Thr Tyr Ile Ser Asp Trp Trp Thr Leu Ala Ala Lys Asn 2545 2550 2555 2560	7680
ctt act gac ttt gca gag caa tat tct atc caa gat tgg gct aaa cgt Leu Thr Asp Phe Ala Glu Gln Tyr Ser Ile Gln Asp Trp Ala Lys Arg 2565 2570 2575	7728
atg aaa gca ttg gta gag caa ggg ttc act gtt cct gaa atc aag acc Met Lys Ala Leu Val Glu Gln Gly Phe Thr Val Pro Glu Ile Lys Thr 2580 2585 2590	7776
atc ctt ggg acc atg cct gcc ttt gaa gtc agt ctt cag gct ctt cag Ile Leu Gly Thr Met Pro Ala Phe Glu Val Ser Leu Gln Ala Leu Gln 2595 2600 2605	7824
aaa gct acc ttc cag aca cct gat ttt ata gtc ccc cta aca gat ttg Lys Ala Thr Phe Gln Thr Pro Asp Phe Ile Val Pro Leu Thr Asp Leu 2610 2615 2620	7872
agg att cca tca gtt cag ata aac ttc aaa gac tta aaa aat ata aaa	7920

Arg Ile Pro Ser Val Gln Ile Asn Phe Lys Asp Leu Lys Asn Ile Lys			
2625	2630	2635	2640
atc cca tcc agg ttt tcc aca cca gaa ttt acc atc ctt aac acc acc ttc			7968
Ile Pro Ser Arg Phe Ser Thr Pro Glu Phe Thr Ile Leu Asn Thr Phe			
2645	2650	2655	
cac att cct tcc ttt aca att gac ttt gta gaa atg aaa gta aag atc			8016
His Ile Pro Ser Phe Thr Ile Asp Phe Val Glu Met Lys Val Lys Ile			
2660	2665	2670	
atc aga acc att gac cag atg ctg aac agt gag ctg cag tgg ccc gtt			8064
Ile Arg Thr Ile Asp Gln Met Leu Asn Ser Glu Leu Gln Trp Pro Val			
2675	2680	2685	
cca gat ata tat ctc agg gat ctg aag gtg gag gac att cct cta gcg			8112
Pro Asp Ile Tyr Leu Arg Asp Leu Lys Val Glu Asp Ile Pro Leu Ala			
2690	2695	2700	
aga atc acc ctg cca gac ttc cgt tta cca gaa atc gca att cca gaa			8160
Arg Ile Thr Leu Pro Asp Phe Arg Leu Pro Glu Ile Ala Ile Pro Glu			
2705	2710	2715	2720
tcc ata atc cca act ctc aac ctt aat gat ttt caa gtt cct gac ctt			8208
Phe Ile Ile Pro Thr Leu Asn Leu Asn Asp Phe Gln Val Pro Asp Leu			
2725	2730	2735	
cac ata cca gaa ttc cag ctt ccc cac atc tca cac aca att gaa gta			8256
His Ile Pro Glu Phe Gln Leu Pro His Ile Ser His Thr Ile Glu Val			
2740	2745	2750	
cct act ttt ggc aag cta tac agt att ctg aaa atc caa tct cct ctt			8304
Pro Thr Phe Gly Lys Leu Tyr Ser Ile Leu Lys Ile Gln Ser Pro Leu			
2755	2760	2765	
tcc aca tta gat gca aat gct gac ata ggg aat gga acc acc tca gca			8352
Phe Thr Leu Asp Ala Asn Ala Asp Ile Gly Asn Gly Thr Thr Ser Ala			
2770	2775	2780	
aac gaa gca ggt atc gca gct tcc atc act gcc aaa gga gag tcc aaa			8400
Asn Glu Ala Gly Ile Ala Ala Ser Ile Thr Ala Lys Gly Glu Ser Lys			
2785	2790	2795	2800
tta gaa gtt ctc aat ttt gat ttt caa gca aat gca caa ctc tca aac			8448
Leu Glu Val Leu Asn Phe Asp Phe Gln Ala Asn Ala Gln Leu Ser Asn			
2805	2810	2815	
cct aag att aat ccg ctg gct ctg aag gag tca gtg aag ttc tcc agc			8496
Pro Lys Ile Asn Pro Leu Ala Leu Lys Glu Ser Val Lys Phe Ser Ser			
2820	2825	2830	
aag tac ctg aga acg gag cat ggg agt gaa atg ctg ttt ttt gga aat			8544
Lys Tyr Leu Arg Thr Glu His Gly Ser Glu Met Leu Phe Phe Gly Asn			
2835	2840	2845	
gct att gag gga aaa tca aac aca gtg gca agt tta cac aca gaa aaa			8592
Ala Ile Glu Gly Lys Ser Asn Thr Val Ala Ser Leu His Thr Glu Lys			
2850	2855	2860	
aat aca ctg gag ctt agt aat gga gtg att gtc aag ata aac aat cag			8640
Asn Thr Leu Glu Leu Ser Asn Gly Val Ile Val Lys Ile Asn Asn Gln			
2865	2870	2875	2880

ctt acc ctg gat agc aac act aaa tac ttc cac aaa ttg aac atc ccc Leu Thr Leu Asp Ser Asn Thr Lys Tyr Phe His Lys Leu Asn Ile Pro 2885	2890	2895	8688	
aaa ctg gac ttc tct agt cag gct gac ctg cgc aac gag atc aag aca Lys Leu Asp Phe Ser Ser Gln Ala Asp Leu Arg Asn Glu Ile Lys Thr 2900	2905	2910	8736	
ctg ttg aaa gct ggc cac ata gca tgg act tct tct gga aaa ggg tca Leu Leu Lys Ala Gly His Ile Ala Trp Thr Ser Ser Gly Lys Gly Ser 2915	2920	2925	8784	
tgg aaa tgg gcc tcg ccc aga ttc tca gat gag gga aca cat gaa tca Trp Lys Trp Ala Ser Pro Arg Phe Ser Asp Glu Gly Thr His Glu Ser 2930	2935	2940	8832	
caa att agt ttc acc ata gaa gga ccc ctc act tcc ttt gga ctg tcc Gln Ile Ser Phe Thr Ile Glu Gly Pro Leu Thr Ser Phe Gly Leu Ser 2945	2950	2955	2960	8880
aat aag atc aat agc aaa cac cta aga gta aac caa aac ttg gtt tat Asn Lys Ile Asn Ser Lys His Leu Arg Val Asn Gln Asn Leu Val Tyr 2965	2970	2975	8928	
gaa tct ggc tcc ctc aac ttt tct aaa ctt gaa att caa tca caa gtc Glu Ser Gly Ser Leu Asn Phe Ser Lys Leu Glu Ile Gln Ser Gln Val 2980	2985	2990	8976	
gat tcc cag cat gtg ggc cac agt gtt cta act gct aaa ggc atg gca Asp Ser Gln His Val Gly His Ser Val Leu Thr Ala Lys Gly Met Ala 2995	3000	3005	9024	
ctg ttt gga gaa ggg aag gca gag ttt act ggg agg cat gat gct cat Leu Phe Gly Glu Gly Lys Ala Glu Phe Thr Gly Arg His Asp Ala His 3010	3015	3020	9072	
tta aat gga aag gtt att gga act ttg aaa aat tct ctt ttc ttt tca Leu Asn Gly Lys Val Ile Gly Thr Leu Lys Asn Ser Leu Phe Phe Ser 3025	3030	3035	3040	9120
gcc cag cca ttt gag atc acg gca tcc aca aac aat gaa ggg aat ttg Ala Gln Pro Phe Glu Ile Thr Ala Ser Thr Asn Asn Glu Gly Asn Leu 3045	3050	3055	9168	
aaa gtt cgt ttt cca tta agg tta aca ggg aag aat gac ttc ctg aat Lys Val Arg Phe Pro Leu Arg Leu Thr Gly Lys Ile Asp Phe Leu Asn 3060	3065	3070	9216	
aac tat gca ctg ttt ctg agt ccc agt gcc cag caa gca agt tgg caa Asn Tyr Ala Leu Phe Leu Ser Pro Ser Ala Gln Gln Ala Ser Trp Gln 3075	3080	3085	9264	
gta agt gct agg ttc aat cag tat aag tac aac caa aat ttc tct gct Val Ser Ala Arg Phe Asn Gln Tyr Lys Tyr Asn Gln Asn Phe Ser Ala 3090	3095	3100	9312	
gga aac aac gag aac att atg gag gcc cat gta gga ata aat gga gaa Gly Asn Asn Glu Asn Ile Met Glu Ala His Val Gly Ile Asn Gly Glu 3105	3110	3115	3120	9360
gca aat ctg gat ttc tta aac att cct tta aca att cct gaa atg cgt			9408	

Ala Asn Leu Asp Phe Leu Asn Ile Pro Leu Thr Ile Pro Glu Met Arg			
3125	3130	3135	
ctc cct tac aca ata atc aca act cct cca ctg aaa gat ttc tct cta			9456
Leu Pro Tyr Thr Ile Ile Thr Thr Pro Pro Leu Lys Asp Phe Ser Leu			
3140	3145	3150	
tgg gaa aaa aca ggc ttg aag gaa ttc ttg aaa acg aca aag caa tca			9504
Trp Glu Lys Thr Gly Leu Lys Glu Phe Leu Lys Thr Thr Lys Gln Ser			
3155	3160	3165	
ttt gat tta agt gta aaa gct cag tat aag aaa aac aaa cac agg cat			9552
Phe Asp Leu Ser Val Lys Ala Gln Tyr Lys Lys Asn Lys His Arg His			
3170	3175	3180	
tcc atc aca aat cct ttg gct gtg ctt tgt gag ttt atc agt cag agc			9600
Ser Ile Thr Asn Pro Leu Ala Val Leu Cys Glu Phe Ile Ser Gln Ser			
3185	3190	3195	3200
atc aaa tcc ttt gac agg cat ttt gaa aaa aac aga aac aat gca tta			9648
Ile Lys Ser Phe Asp Arg His Phe Glu Lys Asn Arg Asn Asn Ala Leu			
3205	3210	3215	
gat ttt gtc acc aaa tcc tat aat gaa aca aaa att aag ttt gat aag			9696
Asp Phe Val Thr Lys Ser Tyr Asn Glu Thr Lys Ile Lys Phe Asp Lys			
3220	3225	3230	
tac aaa gct gaa aaa tct cac gac gag ctc ccc agg acc ttt caa att			9744
Tyr Lys Ala Glu Lys Ser His Asp Glu Leu Pro Arg Thr Phe Gln Ile			
3235	3240	3245	
cct gga tac act gtt cca gtt gtc aat gtt gaa gtg tct cca ttc acc			9792
Pro Gly Tyr Thr Val Pro Val Val Asn Val Glu Val Ser Pro Phe Thr			
3250	3255	3260	
ata gag atg tcg gca ttc ggc tat gtg ttc cca aaa gca gtc agc atg			9840
Ile Glu Met Ser Ala Phe Gly Tyr Val Phe Pro Lys Ala Val Ser Met			
3265	3270	3275	3280
cct agt ttc tcc atc ata ggt tct gac gtc cgt gtg cct tca tac aca			9888
Pro Ser Phe Ser Ile Ile Gly Ser Asp Val Arg Val Pro Ser Tyr Thr			
3285	3290	3295	
tta atc ctg cca tca tta gag ctg cca gtc ctt cat gtc cct aga aat			9936
Leu Ile Leu Pro Ser Leu Glu Leu Pro Val Leu His Val Pro Arg Asn			
3300	3305	3310	
ctc aag ctt tct ctt cca gat ttc aag gaa ttg tgt acc ata agc cat			9984
Leu Lys Leu Ser Leu Pro Asp Phe Lys Glu Leu Cys Thr Ile Ser His			
3315	3320	3325	
att ttt att cct gcc atg ggc aat att acc tat gat ttc tcc ttt aaa			10032
Ile Phe Ile Pro Ala Met Gly Asn Ile Thr Tyr Asp Phe Ser Phe Lys			
3330	3335	3340	
tca agt gtc atc aca ctg aat acc aat gct gaa ctt ttt aac cag tca			10080
Ser Ser Val Ile Thr Leu Asn Thr Asn Ala Glu Leu Phe Asn Gln Ser			
3345	3350	3355	3360
gat att gtt gct cat ctc ctt tct tca tct tca tct gtc att gat gca			10128
Asp Ile Val Ala His Leu Leu Ser Ser Ser Ser Val Ile Asp Ala			

3365	3370	3375	
ctg cag tac aaa tta gag ggc acc aca aga ttg aca aga aaa agg gga Leu Gln Tyr Lys Leu Glu Gly Thr Thr Arg Leu Thr Arg Lys Arg Gly 3380	3385	3390	10176
ttg aag tta gcc aca gct ctg tct ctg agc aac aaa ttt gtg gag ggt Leu Lys Leu Ala Thr Ala Leu Ser Leu Ser Asn Lys Phe Val Glu Gly 3395	3400	3405	10224
agt cat aac agt act gtg agc tta acc acg aaa aat atg gaa gtg tca Ser His Asn Ser Thr Val Ser Leu Thr Thr Lys Asn Met Glu Val Ser 3410	3415	3420	10272
gtg gca aaa acc aca aaa ccg gaa att cca att ttg aga atg aat ttc Val Ala Lys Thr Thr Lys Pro Glu Ile Pro Ile Leu Arg Met Asn Phe 3425	3430	3435	10320
aag caa gaa ctt aat gga aat acc aag tca aaa cct act gtc tct tcc Lys Gln Glu Leu Asn Gly Asn Thr Lys Ser Lys Pro Thr Val Ser Ser 3445	3450	3455	10368
tcc atg gaa ttt aag tat gat ttc aat tct tca atg ctg tac tct acc Ser Met Glu Phe Lys Tyr Asp Phe Asn Ser Ser Met Leu Tyr Ser Thr 3460	3465	3470	10416
gct aaa gga gca gtt gac cac aag ctt agc ttg gaa agc ctc acc tct Ala Lys Gly Ala Val Asp His Lys Leu Ser Leu Glu Ser Leu Thr Ser 3475	3480	3485	10464
tac ttt tcc att gag tca tct acc aaa gga gat gtc aag ggt tcg gtt Tyr Phe Ser Ile Glu Ser Ser Thr Lys Gly Asp Val Lys Gly Ser Val 3490	3495	3500	10512
ctt tct cgg gaa tat tca gga act att gct agt gag gcc aac act tac Leu Ser Arg Glu Tyr Ser Gly Thr Ile Ala Ser Glu Ala Asn Thr Tyr 3505	3510	3515	10560
ttg aat tcc aag agc aca cgg tct tca gtg aag ctg cag ggc act tcc Leu Asn Ser Lys Ser Thr Arg Ser Ser Val Lys Leu Gln Gly Thr Ser 3525	3530	3535	10608
aaa att gat gat atc tgg aac ctt gaa gta aaa gaa aat ttt gct gga Lys Ile Asp Asp Ile Trp Asn Leu Glu Val Lys Glu Asn Phe Ala Gly 3540	3545	3550	10656
gaa gcc aca ctccaa cgc ata tat tcc ctc tgg gag cac agt acg aaa Glu Ala Thr Leu Gln Arg Ile Tyr Ser Leu Trp Glu His Ser Thr Lys 3555	3560	3565	10704
aac cac tta cag cta gag ggc ctc ttt ttc acc aac gga gaa cat aca Asn His Leu Gln Leu Glu Gly Leu Phe Phe Thr Asn Gly Glu His Thr 3570	3575	3580	10752
agc aaa gcc acc ctg gaa ctc tct cca tgg caa atg tca gct ctt gtt Ser Lys Ala Thr Leu Glu Leu Ser Pro Trp Gln Met Ser Ala Leu Val 3585	3590	3595	10800
cag gtc cat gca agt cag ccc agt tcc ttc cat gat ttc cct gac ctt Gln Val His Ala Ser Gln Pro Ser Ser Phe His Asp Phe Pro Asp Leu 3605	3610	3615	10848
ggc cag gaa gtg gcc ctg aat gct aac act aag aac cag aag atc aga			10896

Gly Gln Glu Val Ala Leu Asn Ala Asn Thr Lys Asn Gln Lys Ile Arg			
3620	3625	3630	
tgg aaa aat gaa gtc cgg att cat tct ggg tct ttc cag agc cag gtc			10944
Trp Lys Asn Glu Val Arg Ile His Ser Gly Ser Phe Gln Ser Gln Val			
3635	3640	3645	
gag ctt tcc aat gac caa gaa aag gca cac ctt gac att gca gga tcc			10992
Glu Leu Ser Asn Asp Gln Glu Lys Ala His Leu Asp Ile Ala Gly Ser			
3650	3655	3660	
tta gaa gga cac cta agg ttc ctc aaa aat atc atc cta cca gtc tat			11040
Leu Glu Gly His Leu Arg Phe Leu Lys Asn Ile Ile Leu Pro Val Tyr			
3665	3670	3675	3680
gac aag agc tta tgg gat ttc cta aag ctg gat gtc acc acc agc att			11088
Asp Lys Ser Leu Trp Asp Phe Leu Lys Leu Asp Val Thr Thr Ser Ile			
3685	3690	3695	
ggt agg aga cag cat ctt cgt gtt tca act gcc ttt gtg tac acc aaa			11136
Gly Arg Arg Gln His Leu Arg Val Ser Thr Ala Phe Val Tyr Thr Lys			
3700	3705	3710	
aac ccc aat ggc tat tca ttc tcc atc cct gta aaa gtt ttg gct gat			11184
Asn Pro Asn Gly Tyr Ser Phe Ser Ile Pro Val Lys Val Leu Ala Asp			
3715	3720	3725	
aaa ttc att att cct ggg ctg aaa cta aat gat cta aat tca gtt ctt			11232
Lys Phe Ile Ile Pro Gly Leu Lys Leu Asn Asp Leu Asn Ser Val Leu			
3730	3735	3740	
gtc atg cct acg ttc cat gtc cca ttt aca gat ctt cag gtt cca tcg			11280
Val Met Pro Thr Phe His Val Pro Phe Thr Asp Leu Gln Val Pro Ser			
3745	3750	3755	3760
tgc aaa ctt gac ttc aga gaa ata caa atc tat aag aag ctg aga act			11328
Cys Lys Leu Asp Phe Arg Glu Ile Gln Ile Tyr Lys Lys Leu Arg Thr			
3765	3770	3775	
tca tca ttt gcc ctc acc cta cca aca ctc ccc gag gta aaa ttc cct			11376
Ser Ser Phe Ala Leu Thr Leu Pro Thr Leu Pro Glu Val Lys Phe Pro			
3780	3785	3790	
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Glu Val Asp Val Leu Thr Lys Tyr Ser Gln Pro Glu Asp Ser Leu Ile			
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Pro Phe Phe Glu Ile Thr Val Pro Glu Ser Gln Leu Thr Val Ser Gln			
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Phe Thr Leu Pro Lys Ser Val Ser Asp Gly Ile Ala Ala Leu Asp Leu			
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Asn Ala Val Ala Asn Lys Ile Ala Asp Phe Glu Leu Pro Thr Ile Ile			
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Val Pro Glu Gln Thr Ile Glu Ile Pro Ser Ile Lys Phe Ser Val Pro			

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aaa gca gat tat gtt gaa aca gtc ctg gat tcc aca tgc agc tca acc Lys Ala Asp Tyr Val Glu Thr Val Leu Asp Ser Thr Cys Ser Ser Thr 3905	3910	3915	11760
gta cag ttc cta gaa tat gaa cta aat gtt ttg gga aca cac aaa atc Val Gln Phe Leu Glu Tyr Glu Leu Asn Val Leu Gly Thr His Lys Ile 3925	3930	3935	11808
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Arg Phe Gln Lys Ala Ala Ser Gly Thr Thr Gly Thr Tyr Gln Glu Trp			
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Gln Ala Ser Phe Gln Gly Leu Lys Asp Asn Val Phe Asp Gly Leu Val			
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